



# CPS-VO: Active Resources

CPS PI Meeting  
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VANDERBILT UNIVERSITY

# CPS Virtual Organization



- 2010: NSF established the CPS-VO
  - facilitate and foster interaction and exchanges among CPS PIs and their teams
  - enable sharing of artifacts and knowledge generated by the projects with the broader engineering and scientific communities
  - facilitate and foster collaboration and information exchange between CPS researchers and industry
- Today:
  - central information repository and as a collaboration platform for the rapidly growing CPS research community
  - home for ~210 special interest groups
  - reaches over 11,000 members
  - includes over 12,000 webpages and over 18,000 files capturing the first 10 years of CPS history
  - Home for groups from NSA, DOE, FHWA, DoD

**CPS-VO has become the focal point of the CPS community in the US and it has played a significant role in catalyzing CPS research world-wide**





# Next Generation CPS-VO

- Vanderbilt University, University of Pennsylvania, UCLA and University of Arizona to develop the next generation of the CPS Virtual Organization in the next five years
  - make CPS-VO an **active resource** which becomes a "destination for doing" rather than a repository and collaboration capability,
  - serve as an integration platform for open source CPS tools and models emerging from the research community,
  - make the Portal an active resource for CPS education.

# New Capabilities and Use Cases



- **New Capabilities**
  - **Design Studios** (domain specific, integrated)
  - **Configurable Design Studios** (building blocks, integration frameworks)
  - **Active Repositories** (tools, test benches, benchmarks)
- **Use Cases**
  - **Student competitions**
  - **UAV design studio, AVM OpenMETA**
  - **Verification tool repository**





# Community Contributions

- End-to-end design and simulation tools and test beds including model repositories, tools and web-based user interfaces to access resources
- Individual tools that can be integrated into design flows
- Models and code integrated into open repositories
- Student competition platforms



# Ongoing Work

- Portal usability upgrade – please help by providing feedback!
- Undergraduate student competition **pilot**:
  - PREMONITION project scenario; UAV mission
  - Teams: **Vanderbilt, UPenn, UA and UCLA**
  - Industry sponsor: **Microsoft Research**
  - Correct-by-construction design and real-life test
  - Please access to details on the VO competition group
- VO Infrastructure extension for active resources





# Agenda

- Student Competitions In CPS: A Template  
Jonathan Sprinkle, UA
- Student Competitions in the Curriculum  
Julie Adams, VU
- Student Experience  
Paulo Tabuada, UCLA
- UAV Test Bed for the CPS Community  
Jnaneshwar Das, UPenn
- CPS-VO Portal for Active Resources  
Chris vanBuskirk, VU